TABLE 1

SUMMARY OF RISK-BASED SCREENING LEVELS[1] FOR CHEMICALS OF POTENTIAL CONCERN IN SOIL

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

CAS No.	Compound	RBSL in milligrams per kilogram (mg/kg)					
		Construction Worker		Outdoor Commercial/Industrial Worker		Indoor Commercial/Industrial Worker	
		Cancer	Noncancer	Cancer	Noncancer	Cancer	Noncancer
Polychlorinated Biphenyls (PCBs)							
11141165	Aroclor-1232	7.6E+00	--	7.4E-01	--	--	--
12672296	Aroclor-1248	7.6E+00	--	7.4E-01	--	--	--
11097691	Aroclor-1254	7.6E+00	4.4E+00	7.4E-01	1.1E+01	--	--
11096825	Aroclor-1260	7.6E+00	--	7.4E-01	--	--	--
Metals							
7440382	Arsenic	2.0E+00	7.6E+01	2.4E-01	2.4E+02	--	--
7440439	Cadmium	4.8E+02	1.2E+02	1.3E+03	5.0E+02	--	--
7440508	Copper	NC	1.1E+04	NC	3.5E+04	--	--
7439921	Lead[2]	9.8E+02		3.3E+03		--	
7439976	Mercury	--	7.0E+01	--	1.8E+02	--	--
7440666	Zinc	NC	9.0E+04	NC	2.9E+05	--	--
Volatile Organic Compounds (VOCs)[3]							
100414	Ethylbenzene	1.5E+03	2.4E+04	1.6E+02	6.2E+04	--	--
127184	Tetrachloroethylene (PCE)	3.1E+01	2.4E+03	3.2E+00	6.2E+03	--	--
108883	Toluene	--	1.9E+04	--	4.9E+04	--	--
79016	Trichloroethylene (TCE)	1.3E+03	7.1E+01	1.3E+02	1.8E+02	--	--
108383	m/p-Xylenes	--	4.8E+04	--	1.2E+05	--	--
95476	o-Xylene	--	4.8E+04	--	1.2E+05	--	--

Notes:

1. Calculation of risk-based screening levels (RBSLs) presented in Appendix B.
2. RBSLs developed for lead based on blood-lead levels, not probability of increased cancer risk or noncancer hazard quot
3. Inhalation pathways not incorporated into the development of RBSLs for volatile organic compounds. Volatilization of ch from the subsurface to ambient or indoor air evaluated using soil vapor measurements and RBSLs developed for this da

Abbreviations:

CAS No. = chemical abstract service number
NC = noncarcinogenic
RBSL = risk-based screening level
-- = not applicable

TABLE 2

SUMMARY OF RISK-BASED SCREENING LEVELS[1] FOR CHEMICALS OF POTENTIAL CONCERN IN SOIL VAPOR

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

CAS No.	Compound	RBSL in micrograms per liter (µg/L)					
		Construction Worker - Exposure to Ambient Air		Outdoor Commercial/Industrial Worker - Exposure to Ambient Air		Indoor Commercial/Industrial Worker - Exposure to Indoor Air	
		Cancer	Noncancer	Cancer	Noncancer	Cancer	Noncancer
67663	Chloroform	3.5E+03	7.9E+04	7.0E+02	4.0E+05	1.4E+00	8.0E+02
75354	1,1-Dichloroethylene	--	3.3E+04	--	1.7E+05	--	2.0E+02
127184	Tetrachloroethylene (PCE)	4.5E+03	1.3E+04	9.1E+02	6.7E+04	1.6E+00	1.2E+02
108883	Toluene	--	6.6E+04	--	3.3E+05	--	8.9E+02
71556	1,1,1-Trichloroethane	NC	8.8E+05	NC	4.4E+06	NC	7.0E+03
79016	Trichloroethylene (TCE)	1.0E+04	1.7E+05	2.0E+03	8.6E+05	4.4E+00	1.9E+03
108383	m/p-Xylenes	--	1.3E+05	--	6.3E+05	--	2.2E+03

Notes:

1. Calculation of risk-based screening levels presented in Appendix B.

Abbreviations:

CAS No. = chemical abstract service number
NC = noncarcinogenic
RBSL = risk-based screening level
-- = not applicable

TABLE 3

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE I AREA

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

CAS No.	Chemical	Maximum Concentration (mg/kg)	Soil RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil RBSL -- Construction Worker		Predicted Risks	
			Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient	Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient
12672296	**Aroclor-1248**	29	7.4E-01	--	**3.9E-05**	--	7.6E+00	--	**3.8E-06**	--
11096825	**Aroclor-1260**	13	7.4E-01	--	**1.7E-05**	--	7.6E+00	--	**1.7E-06**	--
100414	Ethylbenzene	0.0045	1.6E+02	6.2E+04	2.9E-11	7.3E-08	1.5E+03	2.4E+04	3.0E-12	1.9E-07
127184	Tetrachloroethylene (PCE)	0.0084	3.2E+00	6.2E+03	2.6E-09	1.4E-06	3.1E+01	2.4E+03	2.7E-10	3.5E-06
108883	Toluene	0.0085	--	4.9E+04	--	1.7E-07	--	1.9E+04	--	4.5E-07
79016	Trichloroethylene (TCE)	0.094	1.3E+02	1.8E+02	7.1E-10	5.1E-04	1.3E+03	7.1E+01	7.3E-11	1.3E-03
1330207	m/p-Xylenes	0.017	--	1.2E+05	--	1.4E-07	--	4.8E+04	--	3.6E-07
95476	o-Xylene	0.0055	--	1.2E+05	--	4.5E-08	--	4.8E+04	--	1.2E-07
Cumulative Risk/Hazard Index					6.E-05	5.E-04			6.E-06	1.E-03

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for either receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
mg/kg = milligrams per kilogram
RBSL = risk-based screening level
-- = not applicable

TABLE 4

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE II AREA

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

CAS No.	Chemical	Maximum Concentration (mg/kg)	Soil RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil RBSL -- Construction Worker		Predicted Risks	
			Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient	Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient
12672296	**Aroclor-1248**	960	7.4E-01	--	**1.3E-03**	--	7.6E+00	--	**1.3E-04**	--
11096825	Aroclor-1260	0.3	7.4E-01	--	4.0E-07	--	7.6E+00	--	3.9E-08	--
7440508	Copper	193	NC	3.5E+04	--	5.4E-03	NC	1.1E+04	--	1.7E-02
7440666	Zinc	607	NC	2.9E+05	--	2.1E-03	NC	9.0E+04	--	6.7E-03
108883	Toluene	0.0021	--	4.9E+04	--	4.3E-08	--	1.9E+04	--	1.1E-07
1330207	m/p-Xylenes	0.0036	--	1.2E+05	--	2.9E-08	--	4.8E+04	--	7.6E-08
95476	o-Xylene	0.0024	--	1.2E+05	--	1.9E-08	--	4.8E+04	--	5.0E-08
Cumulative Risk/Hazard Index					1.E-03	8.E-03			1.E-04	2.E-02

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for either receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
mg/kg = milligrams per kilogram
RBSL = risk-based screening level
-- = not applicable

TABLE 5

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS --
PHASE IIIa AREA
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

CAS No.	Chemical	Maximum Concentration (mg/kg)	Soil RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil RBSL -- Construction Worker		Predicted Risks	
			Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient	Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient
12672296	**Aroclor-1248**	7.1	7.4E-01	--	**9.5E-06**	--	7.6E+00	--	9.3E-07	--
11097691	**Aroclor-1254**	5.2	7.4E-01	1.1E+01	**7.0E-06**	4.9E-01	7.6E+00	4.4E+00	6.8E-07	**1.2E+00**
11096825	Aroclor-1260	0.1	7.4E-01	--	1.3E-07	--	7.6E+00	--	1.3E-08	--
7440382	**Arsenic**	60	2.4E-01	2.4E+02	**2.5E-04**	2.5E-01	2.0E+00	7.6E+01	**2.9E-05**	7.9E-01
7440508	Copper	257	NC	3.5E+04	--	7.2E-03	NC	1.1E+04	--	2.3E-02
Cumulative Risk/Hazard Index					3.E-04	7.E-01			3.E-05	2.E+00

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for either receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
mg/kg = milligrams per kilogram
RBSL = risk-based screening level
-- = not applicable

TABLE 6

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE IV AREA

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

CAS No.	Chemical	Maximum Concentration (mg/kg)	Soil RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil RBSL -- Construction Worker		Predicted Risks	
			Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient	Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient
11141165	**Aroclor-1232**	470	7.4E-01	--	**6.3E-04**	--	7.6E+00	--	**6.2E-05**	--
12672296	Aroclor-1248	0.25	7.4E-01	--	3.4E-07	--	7.6E+00	--	3.3E-08	--
11096825	**Aroclor-1260**	1.2	7.4E-01	--	**1.6E-06**	--	7.6E+00	--	1.6E-07	--
7440382	**Arsenic**	120	2.4E-01	2.4E+02	**5.0E-04**	5.0E-01	2.0E+00	7.6E+01	**5.9E-05**	**1.6E+00**
7440439	Cadmium	2.8	1.3E+03	5.0E+02	2.2E-09	5.6E-03	4.8E+02	1.2E+02	5.9E-09	2.3E-02
7439976	Mercury	0.98	--	1.8E+02	--	5.3E-03	--	7.0E+01	--	1.4E-02
Cumulative Risk/Hazard Index					1.E-03	5.E-01			1.E-04	2.E+00

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for either receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
mg/kg = milligrams per kilogram
RBSL = risk-based screening level
-- = not applicable

TABLE 7

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE VI AREA

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

CAS No.	Chemical	Maximum Concentration (mg/kg)	Soil RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil RBSL -- Construction Worker		Predicted Risks	
			Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient	Cancer (mg/kg)	Noncancer (mg/kg)	Risk	Hazard Quotient
12672296	Aroclor-1248	0.14	7.4E-01	--	1.9E-07	--	7.6E+00	--	1.8E-08	--
11096825	Aroclor-1260	0.57	7.4E-01	--	7.7E-07	--	7.6E+00	--	7.5E-08	--
7440382	**Arsenic**	74	2.4E-01	2.4E+02	**3.1E-04**	3.1E-01	2.0E+00	7.6E+01	**3.6E-05**	9.8E-01
Cumulative Risk/Hazard Index					3.E-04	3.E-01			4.E-05	1.E+00

Notes:

Chemicals contributing a cancer risk level greater than $1x10^{-6}$ or a hazard quotient of 1 for either receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
mg/kg = milligrams per kilogram
RBSL = risk-based screening level
-- = not applicable

TABLE 8

SUMMARY OF MAXIMUM PREDICTED LIFETIME EXCESS CANCER RISKS AND NONCANCER HAZARD INDEXES -- SOIL EXPOSURE

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Area	Cancer Risks		Noncancer HIs	
	Outdoor Commercial/Industrial Worker	Construction Worker	Outdoor Commercial/Industrial Worker	Construction Worker
Phase I	6E-05	6E-06	5E-04	1E-03
Phase II	1E-03	1E-04	8E-03	2E-02
Phase IIIa	3E-04	3E-05	7E-01	2E+00
Phase IIIb	--[1]	--[1]	--[1]	--[1]
Phase IV	1E-03	1E-04	5E-01	2E+00
Phase V	--[2]	--[2]	--[2]	--[2]
Phase VI	3E-04	4E-05	3E-01	1E+00

Notes:

1. No chenicals of potential concern were identified in soil in the Phase IIIb Area.
2. No chemicals were detected in soil in the Phase V Area except for metals below background.

Abbreviations:

HI = hazard index
-- = not applicable

TABLE 9

COMPARISON OF MAXIMUM SOIL VAPOR CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE I AREA

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

CAS No.	Chemical	Maximum Concentration (µg/L)	Soil Vapor RBSL -- Indoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Construction Worker		Predicted Risks	
			Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient
67663	**Chloroform**	2.5	1.4E+00	8.0E+02	**1.8E-06**	3.1E-03	7.0E+02	4.0E+05	3.6E-09	6.3E-06	3.5E+03	7.9E+04	7.1E-10	3.1E-05
75354	1,1-Dichloroethylene	22	--	2.0E+02	--	1.1E-01	--	1.7E+05	--	1.3E-04	--	3.3E+04	--	6.6E-04
127184	**Tetrachloroethylene (PCE)**	120	1.6E+00	1.2E+02	**7.6E-05**	**1.0E+00**	9.1E+02	6.7E+04	1.3E-07	1.8E-03	4.5E+03	1.3E+04	2.6E-08	8.9E-03
108883	Toluene	4.7	--	8.9E+02	--	5.3E-03	--	3.3E+05	--	1.4E-05	--	6.6E+04	--	7.2E-05
71556	1,1,1-Trichloroethane	13	NC	7.0E+03	--	1.9E-03	NC	4.4E+06	--	3.0E-06	NC	8.8E+05	--	1.5E-05
79016	**Trichloroethylene (TCE)**	1900	4.4E+00	1.9E+03	**4.3E-04**	**1.0E+00**	2.0E+03	8.6E+05	9.5E-07	2.2E-03	1.0E+04	1.7E+05	1.9E-07	1.1E-02
1330207	m,p-Xylenes	2	--	2.2E+03	--	9.0E-04	--	6.3E+05	--	3.2E-06	--	1.3E+05	--	1.6E-05
Cumulative Risk/Hazard Index					5.E-04	2.E+00			1.E-06	4.E-03			2.E-07	2.E-02

Notes:

Chemicals contributing a cancer risk level greatern than $1x10^{-6}$ or a hazard quotient of 1 for either receptor are highlighted in **bold**.

Abbreviations:

CAS No. = chemical abstract service number
µg/L = micrograms per liter
RBSL = risk-based screening level
-- = not applicable

TABLE 10

COMPARISON OF MAXIMUM SOIL VAPOR CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE II AREA

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

CAS No.	Chemical	Maximum Concentration (µg/L)	Soil Vapor RBSL -- Indoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Construction Worker		Predicted Risks	
			Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient
127184	Tetrachloroethylene (PCE)	0.53	1.6E+00	1.2E+02	3.4E-07	4.5E-03	9.1E+02	6.7E+04	5.8E-10	7.9E-06	4.5E+03	1.3E+04	1.2E-10	4.0E-05
79016	Trichloroethylene (TCE)	2.4	4.4E+00	1.9E+03	5.5E-07	1.3E-03	2.0E+03	8.6E+05	1.2E-09	2.8E-06	1.0E+04	1.7E+05	2.4E-10	1.4E-05
Cumulative Risk/Hazard Index					9.E-07	6.E-03			2.E-09	1.E-05			4.E-10	5.E-05

Abbreviations:
CAS No. = chemical abstract service number
µg/L = micrograms per liter
RBSL = risk-based screening level

TABLE 11

COMPARISON OF MAXIMUM SOIL VAPOR CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- PHASE V AREA

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

CAS No.	Chemical	Maximum Concentration (µg/L)	Soil Vapor RBSL -- Indoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Outdoor Commercial/Industrial Worker		Predicted Risks		Soil Vapor RBSL -- Construction Worker		Predicted Risks	
			Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient	Cancer (µg/L)	Noncancer (µg/L)	Risk	Hazard Quotient
127184	Tetrachloroethylene (PCE)	0.22	1.6E+00	1.2E+02	1.4E-07	1.9E-03	9.1E+02	6.7E+04	2.4E-10	3.3E-06	4.5E+03	1.3E+04	4.8E-11	1.6E-05
108883	Toluene	0.51	--	8.9E+02	--	5.7E-04	--	3.3E+05	--	1.6E-06	--	6.6E+04	--	7.8E-06
1330207	m,p-Xylenes	0.48	--	2.2E+03	--	2.1E-04	--	6.3E+05	--	7.7E-07	--	1.3E+05	--	3.8E-06
Cumulative Risk/Hazard Index					1.E-07	3.E-03			2.E-10	6.E-06			5.E-11	3.E-05

Abbreviations:
CAS No. = chemical abstract service number
µg/L = micrograms per liter
RBSL = risk-based screening level
-- = not applicable

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TABLE 12

SUMMARY OF MAXIMUM PREDICTED LIFETIME EXCESS CANCER RISKS AND NONCANCER HAZARD INDEXES -- SOIL VAPOR EXPOSURE

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Area	Cancer Risks			Noncancer HIs		
	Indoor Commercial/Industrial Worker	Outdoor Commercial/Industrial Worker	Construction Worker	Indoor Commercial/Industrial Worker	Outdoor Commercial/Industrial Worker	Construction Worker
Phase I	5E-04	1E-06	2E-07	2E+00	4E-03	2E-02
Phase II	9E-07	2E-09	4E-10	6E-03	1E-05	5E-05
Phase IIIa	--[1]	--[1]	--[1]	--[1]	--[1]	--[1]
Phase IIIb	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]
Phase IV	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]
Phase V	1E-07	2E-10	5E-11	3E-03	6E-06	3E-05
Phase VI	--[1]	--[1]	--[1]	--[1]	--[1]	--[1]

Notes:

1. No volatile organic compounds were detected in soil vapor in the Phase IIIa and Phase VI Areas.
2. No chemicals of potential concern were identified in soil vapor in the Phase IIIb and Phase IV Areas.

Abbreviations:

HI = hazard index
VOC = volatile organic compound
-- = not applicable

TABLE 13

SUMMARY OF MAXIMUM PREDICTED LIFETIME EXCESS CANCER RISKS AND NONCANCER HAZARD INDEXES -- CUMULATIVE EXPOSURE

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Area	Cancer Risks			Noncancer HIs		
	Indoor Commercial/Industrial Worker	Outdoor Commercial/Industrial Worker	Construction Worker	Indoor Commercial/Industrial Worker	Outdoor Commercial/Industrial Worker	Construction Worker
Phase I	**5E-04**	6E-05	6E-06	**2**	5E-03	2E-02
Phase II	9E-07	**1E-03**	**1E-04**	6E-03	8E-03	2E-02
Phase IIIa	--[1]	**3E-04**	3E-05	--[1]	7E-01	**2**
Phase IIIb	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]
Phase IV	--[3]	**1E-03**	**1E-04**	--[3]	1	**2**
Phase V	1E-07	2E-10	5E-11	3E-03	6E-06	3E-05
Phase VI	--[1]	**3E-04**	4E-05	--[1]	3E-01	1

Notes:

Cancer risks and HIs above the ranges considered acceptable by regulatory agencies are highlighted in **bold**.

1. No volatile organic compounds were detected in soil vapor in the Phase IIIa and Phase VI Areas.
2. No chemicals of potential concern (COPCs) were identified in soil or soil vapor in the Phase IIIb Area.
3. No COPCs were identified in soil vapor in the Phase IV Area.

Abbreviations:

HI = hazard index
VOC = volatile organic compound
-- = not applicable

TABLE 14

COMPARISON OF MAXIMUM SOIL CONCENTRATIONS TO RISK-BASED SCREENING LEVELS -- LEAD

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Area	Lead Maximum Concentration (mg/kg)	Outdoor Commercial/Industrial Worker		Construction Worker	
		Screening Level	Risk Ratio[1]	Screening Level	Risk Ratio[1]
Phase I	8 [2]	3300	--	980	--
Phase II	82	3300	2.5E-02	980	8.4E-02
Phase IIIa	157	3300	4.8E-02	980	1.6E-01
Phase IIIb	12 [2]	3300	--	980	--
Phase IV	55 [2]	3300	--	980	--
Phase V	28.8 [2]	3300	--	980	--
Phase VI	23.4 [2]	3300	--	980	--

Notes:

1. Ratio of lead concentration to risk-based screening level.
2. Below 80.9 mg/kg, the maximum background level established for the Site from Bradford, et al. (1996) as modified by the City of Vernon H&EC; risk ratios not estimated.

Abbreviations:

mg/kg = milligrams per kilogram
NA = not analyzed
-- = not applicable

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TABLE 15

SOIL SCREENING LEVELS FOR SELECTED VOCS FOR THE PROTECTION OF GROUNDWATER

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

depth (ft)	Concentration in micrograms per kilogram (ug/kg)[2]									
	Trichloroethene	Tetrachloroethene	Benzene	Toluene	n-Butyl benzene	1,2-Dichloroethane	Isopropyl benzene	n-Propyl benzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
1	152	764	15	9,058	169,622	1.8	39,451	169,622	282,856	62,394
10	145	732	15	8,670	162,348	1.7	37,759	162,348	270,726	59,718
20	138	694	14	8,227	154,053	1.6	35,830	154,053	256,893	56,667
30	130	655	13	7,769	145,478	1.5	33,836	145,478	242,593	53,513
40	122	615	12	7,292	136,547	1.4	31,758	136,547	227,700	50,227
50	114	572	11	6,777	126,914	1.3	29,518	126,914	211,638	46,684
60	80	404	8	4,790	89,688	0.9	20,860	89,688	149,561	32,991
70	60	301	6	3,565	66,753	0.7	15,526	66,753	111,315	24,554
80	52	260	5	3,081	57,688	0.6	13,417	57,688	96,199	21,220
90	36	183	4	2,164	40,521	0.5	9,425	40,521	67,572	14,905
100	27	138	3	1,634	30,593	0.5	7,115	30,593	51,016	11,253
110	12	59	1	702	13,146	0.5	3,057	13,146	21,921	4,835
120	9	44	1	530	9,819	0.5	2,312	9,819	16,370	3,621
130	5	19	1	229	4,159	0.5	1,004	4,159	6,930	1,542
140	5	10	1	150	2,144	0.5	770	2,144	3,567	807
149	5	5	1	150	260	0.5	770	260	369	330

1. Calculations based on Appendix A, "Attenuation Factor Method For VOCs" of "Remediation Guidance For Petroleum and VOC Impacted Sites" in Interim Site Assessment & Cleanup Guidebook published by the California Regional Water Quality Control Board, Los Angeles Region.
2. In some cases, detection limits were above screening levels.

TABLE 16A

SITE-SPECIFIC REMEDIATION GOALS
VOCs in Soil Vapor
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Compound	Remediation Goal (micrograms per liter; µg/L)	Explanation
Under Future Use as a Power Plant		
No COCs identified.		
Under Alternative Future Commercial/Industrial Use		
Chloroform	4.7	Derived from the Carcinogenic RBSL[1] for Indoor Commercial/Industrial Workers (1.4 mg/L). A chloroform concentration of 4.7 mg/L is protective of cumulative indoor commercial/industrial worker exposure to the VOC COCs, based on a target cancer risk of 10^{-5}.
Tetrachloroethylene (PCE)	5.3	Derived from the Carcinogenic RBSL for Indoor Commercial/Industrial Workers (1.6 mg/L). A PCE concentration of 5.3 mg/L is protective of cumulative indoor commercial/industrial worker exposure to the VOC COCs, based on a target cancer risk of 10^{-5}.
Trichloroethylene (TCE)	14.7	Derived from the Carcinogenic RBSL for Indoor Commercial/Industrial Workers (4.4 mg/L). A TCE concentration of 14.7 mg/L is protective of cumulative indoor commercial/industrial worker exposure to the VOC COCs, based on a target cancer risk of 10^{-5}.

Notes:
1. RBSL- Risk-Based Screening Level. Developed based on the methodology described in Appendix B, RBSLs were used to conduct the screening-level human health risk assessment (Section 4.0).

TABLE 16B

SITE-SPECIFIC REMEDIATION GOALS
PCBs and Metals
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Compound	Remediation Goal (milligrams per kilogram; mg/kg)	Explanation
PCBs[1] in Soil		
Aroclor-1254	4.4	Noncarcinogenic RBSL[2] for Construction Workers
Total PCBs (Aroclor-1232, Aroclor-1248, Aroclor-1254, and Aroclor-1260) *For soil that may be left exposed at the surface following redevelopment*	7.4	Derived from the Carcinogenic RBSL for Outdoor Industrial Workers (0.74 mg/kg). A total PCB concentration of 7.4 mg/kg is protective of cumulative industrial worker exposure to PCBs, based on a target cancer risk of 10^{-5}.
Total PCBs (Aroclor-1232, Aroclor-1248, Aroclor-1254, and Aroclor-1260) *For unexposed soil left below pavement or other protective ground cover following redevelopment*	76	Derived from the Carcinogenic RBSL for Construction Workers (7.6 mg/kg). A total PCB concentration of 76 mg/kg is protective of cumulative construction worker exposure to PCBs, based on a target cancer risk of 10^{-5}.
PCBs in Concrete		
Total PCBs (Aroclor-1232, Aroclor-1248, Aroclor-1254, and Aroclor-1260)	7.6	Carcinogenic RBSL for Construction Workers. A total PCB concentration of 7.6 mg/kg is protective of cumulative construction worker exposure to PCBs, based on a target cancer risk of 10^{-6}. Applying this remediation goal (versus a remediation goal based on a target cancer risk of 10^{-5}, 76 mg/kg) ensures that waste criteria for concrete containing PCBs is also met [i.e. less than 50 mg/kg, as defined in 40 CFR Section 761.61(a)(4)(i)(A)].
Metals in Soil		
Arsenic	10	Local Maximum Background Concentration in Soil, based on meeting with City of Vernon in April 2008.

Notes:
1. PCBs- Polychlorinated Biphenyls.
2. RBSL- Risk-Based Screening Level. Developed based on the methodology described in Appendix B, RBSLs were used to conduct the screening-level human health risk assessment (Section 4.0).

TABLE 16C

SITE-SPECIFIC REMEDIATION GOALS[1]
VOCs in Soil
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

depth (ft)	Concentration in micrograms per kilogram (µg/kg)				
	Trichloroethene	Tetrachloroethene	Benzene	Toluene	1,2-Dichloroethane
0	152	764	15	9,058	1.8
10	145	732	15	8,670	1.7
20	138	694	14	8,227	1.6
30	130	655	13	7,769	1.5
40	122	615	12	7,292	1.4
50	114	572	11	6,777	1.3
60	80	404	8	4,790	0.9
70	60	301	6	3,565	0.7
80	52	260	5	3,081	0.6
90	36	183	4	2,164	0.5
100	27	138	3	1,634	0.5
110	12	59	1	702	0.5
120	9	44	1	530	0.5
130	5	19	1	229	0.5
140	5	10	1	150	0.5
149	5	5	1	150	0.5

Notes:

1. Calculations based on Appendix A, "Attenuation Factor Method For VOCs" of "Remediation Guidance For Petroleum and VOC Impacted Sites" in Interim Site Assessment & Cleanup Guidebook published by the California Regional Water Quality Control Board, Los Angeles Region.

TABLE 17
SCREENING OF SOIL TECHNOLOGIES[1,2]
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Technology Type	Description	Remediation Scenario	Effectiveness	Implementability	Cost	Screening Comments
NO ACTION						
No Action	No further remedial action would take place at the Site. Retained for comparative purposes only.	All Shallow and Deep COC[3]-impacted soils	Poor. Does not meet RAOs[4]. Does not reduce mobility, toxicity, or volume of known wastes.	Good	Low. There are no costs associated with this alternative.	Retained- NCP[5] requirements [40 CFR[6] 300.430 (e)(6)].
INSTITUTIONAL CONTROLS						
Institutional controls (examples) - Deed covenants - Land use covenants - Groundwater use restriction - Zoning	Institutional controls are legal and administrative controls to prevent or control exposure to site occupants if residual contaminants remain on-site. These typically run with the land for perpetuity or as long as residual contamination exists.	All Shallow and Deep COC-impacted soils	Moderate	Moderate	Low	Not retained. Institutional Controls would most likely include either deed or land use covenants, and possibly long-term groundwater monitoring. Property owner input is necessary to make determinations regarding future Site use. Evaluation of groundwater is not included in this FS[7].
CONTAINMENT						
Capping	Creates a direct contact or migration barrier using a combination of soil/clay/concrete/ asphalt/geotextile liners to prevent direct contact with impacted soil or leaching to groundwater by infiltration. May also involve sub-slab venting beneath building foundations. Additional grading to ensure uniform surface for installation may be necessary. Both short-term construction and long-term quality assurance monitoring programs would be necessary. Could require future repairs or modifications to site redevelopment structures if found cap was breached.	All Shallow and Deep COC-impacted soils	Good	Poor. Does not meet the RAOs for the site. Does not reduce toxicity or volume through treatment of COCs.	Moderate	Not retained. Future site use not finalized. Any potential future capping requirements would be met by site redevelopment slabs and pavements.
Vapor Barrier	Creates a vapor migration barrier using a combination of low permeability materials including synthetic liners to protect from volatile vapor intrusion into buildings or other structures. May also involve passive or active sub-slab venting beneath building foundations. Both short-term construction and long-term quality assurance monitoring programs would be necessary. Requires additional site grading to ensure uniform application. Can be easily breached during any future site redevelopment. Not effective on inorganic or non-volatile organic compounds.	PCB[8]-impacted soils	Poor. Does not meet RAOs. Does not reduce mobility, toxicity, or volume through treatment. Does not reduce the magnitude of residual risk.	Moderate	Moderate. Expensive capitol and annual operations and maintenance costs.	Not retained due to low-volatility of PCBs.
		VOC[9]-impacted soils	Good	Moderate	Moderate. Expensive capitol and annual operations and maintenance costs.	Not retained for shallow- and deep-impacted soils. Any potential future vapor barrier requirements would be dictated by site reuse. Vapor barrier requirement may be negated by operation of an SVE[10] system.
		Metals-impacted soils	N/A[11]	N/A	N/A	Not applicable due to non-volatility of metals.

TABLE 17
SCREENING OF SOIL TECHNOLOGIES[1,2]
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Technology Type	Description	Remediation Scenario	Effectiveness	Implementability	Cost	Screening Comments
EX SITU TREATMENT						
Excavation/Removal	Excavation of impacted soils followed by treatment or disposal; excavated areas restored with clean backfill. Usually requires shoring at depths greater than 10 feet bgs. May require additional sloping of side walls. Excavation depth limited to size of excavator. Deeper excavations may require special equipment and engineering.	All Shallow and Deep COC-impacted soils	Good. Would meet RAOs for Site.	Moderate	Moderate	Retained. Excavation is a presumptive remedy for COC-impacted soil.
Onsite Low Temperature Thermal Desorption	Excavated soil is heated to thermally desorb COCs, which are then treated in the vapor phase. Treated soil can either be used as site backfill or disposed/recycled offsite. Not effective for inorganic compounds. Thermal desorption unit operation requires approximately 1/2 acre of available space for operation, excluding stockpile areas. Requires fuel source (propane or natural gas), installation of electrical power or use of portable electrical generators. Requires AQMD permit and fees to operate, and additional compliance monitoring costs. Excavation, stockpiling, and loading of COC-impacted soil necessary to feed unit. Temperatures typically not high enough to desorb and combust PCBs.	PCB-impacted soils	Poor. Temperatures not high enough to volatilize PCBs. Does not meet RAOs for the site. Does not reduce the toxicity, mobility, or volume through treatment.	Poor. Significant regulatory permitting issues and off-gas collection and treatment issues associated with thermal destruction of PCBs.	Moderate	Not retained.
		VOC-impacted soils	Moderate	Moderate	Moderate	Not retained for deeper VOC-impacted soils due to high relative costs when compared to in situ SVE. Also, not retained due to high permitting and operational costs.
		Metals-impacted soils	N/A	N/A	N/A	Not applicable for metals-impacted soil.
Incineration	Incineration uses controlled flame combustion to destroy COCs. Combustion of remaining VOCs and PCBs in secondary combustion chamber. Requires stringent off gas collection and treatment. High temperatures necessary to break down inorganic and non-volatile compounds. Incineration unit operational costs are high. Hazardous residual ash requires landfill disposal. Not feasible to perform on-site due to regulatory permitting requirements. Requires excavation and transportation to out-of-state facilities for incineration.	PCB-impacted soils	Moderate	Poor. Not technically feasible on-site based on regulatory approval challenges. Would require transportation of impacted material to out-of-state facility to implement off-site.	High. Expensive operations, maintenance and monitoring costs.	Not retained due to high costs.
		VOC-impacted soils	Moderate	Poor. Not technically feasible on-site based on regulatory approval challenges. Would require transportation of impacted material to out-of-state facility to implement off-site.	High. Expensive operations, maintenance and monitoring costs. Relatively more expensive than SVE technology	Not retained due to high costs.
		Metals-impacted soils	Poor. Does not meet RAOs for the site.	Poor. Not technically feasible on-site based on regulatory approval challenges. Would require transportation of impacted material to out-of-state facility to implement off-site.	High. Expensive operations, maintenance and monitoring costs.	Not retained due to high costs.

TABLE 17
SCREENING OF SOIL TECHNOLOGIES[1,2]
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Technology Type	Description	Remediation Scenario	Effectiveness	Implementability	Cost	Screening Comments
Onsite Landfarming/ Bioremediation	Soil is spread in shallow lifts (6-inch to 1-foot thick) and treated by supplying air, moisture and nutrients needed to enhance bioremediation of COCs. Not effective on metals. Requires available space to thinspread soil. May require bottom liner, fugitive dust and emission controls, and run-on and run-off stormwater controls. Requires operations, maintenance, and monitoring.	PCB-impacted soils	Poor. Not a reliable or proven technology for PCBs. Does not meet RAOs for the site. Does not reduce the mobility, toxicity, or volume through treatment.	Moderate. Requires fugitive dust and emission controls, potential AQMD permitting requirements, and stormwater controls.	Moderate	Not retained; PCBs degrade very slowly aerobically and may require specially formulated admixtures to enhance degradation. Also not retained due to additional costs associated with necessary Site controls.
		VOC-impacted soils	Moderate	Moderate. Requires fugitive dust and emission controls, potential AQMD permitting requirements, and stormwater controls.	Moderate	Not retained due to additional costs associated with necessary Site controls.
		Metals-impacted soils	N/A	N/A	N/A	Not applicable; metals not biodegradable.
Offsite Treatment/Disposal - Landfill Disposal - Thermal Desorption - Stabilization	Excavated soil is loaded into trucks or containers for offsite transport for subsequent treatment or disposal. Offsite treatment/disposal includes thermal desorption, stabilization, and/or landfill disposal.	All Shallow and Deep COC-impacted soils	Good. Does meet RAOs for Site. One of the more common remedial technologies that has previously been broadly implemented.	Moderate. Would require off-site shipment of soil for landfill disposal.	Moderate	Retained. Landfill disposal is a commonly used technology for COC-impacted soils.
IN SITU TREATMENT						
Bioremediation	Intrinsic or enhanced bioremediation. Intrinsic bioremediation includes degradation of organic contaminants by naturally occurring microbes in the subsurface; other attenuation processes such as volatilization also occur. Enhanced bioremediation may include the addition of oxygen, biological agents, or nutrients to assist in degrading contaminants in soil. Requires subsurface injection or delivery gallery, and maintenance and monitoring. Requires a well characterized site; implementation requires long-term operations and monitoring. May require multiple applications of nutrients over a long term period necessary for complete remediation of COC-impacted soils.	PCB-impacted soils	Poor. Not an effectively demonstrated technology for PCBs. Does not meet RAOs for the site. Does not reduce the mobility, toxicity, or volume through treatment.	Poor. Not a broadly implemented technology for PCBs.	Moderate	Not retained; PCBs degrade very slowly and may require specially formulated admixtures to enhance degradation. Also not retained due to nutrient delivery constraints, high maintenance and monitoring costs, and need for multiple applications over a long term.
		VOC-impacted soils	Moderate. Not as effective as SVE for VOC constituents. Effectiveness limited to success of nutrient delivery system. Requires long-term maintenance and monitoring.	Moderate	Moderate	Not retained due to nutrient delivery constraints, high maintenance and monitoring costs, and need for multiple applications over a long term.
		Metals-impacted soils	N/A	N/A	N/A	Not applicable. Metals are not biodegradable.
Soil Vapor Extraction	Volatile vapors removed from soil with slotted piping and a vacuum blower; extracted vapors treated aboveground with activated carbon or thermal oxidizer. This technology is usually implemented to remove VOCs in shallow or deep soils and is effective in moderate to highly permeable soils. Requires the installation of a soil vapor extraction well network, electrical power, AQMD[12] permit, and operations and maintenance. Not effective on inorganic or non-volatile compounds. Usually implemented in moderate to large areas of impacted soils.	PCB-impacted soils	Poor. Not an effective technology for PCB-impacted soils. Does not meet RAOs for the site. Does not reduce the mobility, toxicity, or volume through treatment.	Moderate	Moderate	Not retained due to the non-volatility of PCBs.
		VOC-impacted soils	Good	Good	Moderate	Retained for shallow and deep impacted soils. SVE is a presumptive remedy for VOC-impacted soils.

TABLE 17
SCREENING OF SOIL TECHNOLOGIES[1,2]
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Technology Type	Description	Remediation Scenario	Effectiveness	Implementability	Cost	Screening Comments
Soil Vapor Extraction (continued)		Metals-impacted soils	N/A	N/A	N/A	Not applicable due to non-volatility of metals.
In situ Thermal Desorption (Thermal conduction heating)	Heating subsurface soil using thermal wells via resistive heating elements with associated vapor extraction to remove volatilized contaminants. Soil is heated by thermal conduction, and no current flows through soil. Extracted vapors are treated aboveground with activated carbon or a thermal oxidizer. Demonstrated high costs associated with installation and operation of the thermal heating elements. Requires AQMD permit to operate and long-term operations, maintenance, and permit compliance monitoring.	PCB-impacted soils	Poor. Does not meet RAOs for the site. Does not reduce the mobility, toxicity, or volume through treatment.	Moderate	High	Not retained due to low volatility of PCBs and high costs of implementation and operation of the system.
		VOC-impacted soils	Moderate	Moderate	High	Not retained due to high costs of implementation and operation of the system relative to SVE technologies.
		Metals-impacted soils	N/A	N/A	N/A	Not applicable due to non-volatility of metals.
Stabilization	In situ stabilization involves mixing contaminated soils with inorganic binders such as cement or pozzolans to bind or encapsulate soils. Effectiveness diminishes with higher concentration oily wastes. Requires implementation and mobilization of a stabilization material delivery unit. On-site pilot tests are necessary to estimate delivery quantity of stabilization material. Not effective on volatile compounds.	PCB-impacted soils	Good. Previously demonstrated effective on sites with lower concentrations of PCBs in soil.	Moderate. Would require bench scale mix design.	Moderate	Retained
		VOC-impacted soils	Poor. Will require collection and treatment of VOC vapors generated during stabilization activities.	Moderate	Moderate	Not retained; poor effectiveness on VOCs. High volatility compounds would generate excessive odors during implementation.
		Metals-impacted soils	Good. Stabilization is a commonly applied technology for metals-impacted soils.	Moderate	Moderate	Retained

Notes:
1. Definitions of Criteria:
   -Effectiveness is ability of the remedial technology to achieve remedial action objectives;
   -Implementability is a measure of the technical and administrative feasibility of constructing, operating and maintaining a remedial alternative; and,
   -Cost refers to a relative cost compared with other technologies in same technology type. Costs will be refined later in the FS process.
2. Table uses a relative rating scheme: Good, Moderate, Poor for effectiveness and implementability criteria; High, Moderate, and Low for cost criteria.
3. COC = Chemical of Concern.
4. RAOs = Remedial Action Objectives.
5. NCP = National Contingency Plan.
6. CFR = Code of Federal Regulations.
7. FS = Feasibility Study.
8. PCB = Polychlorinated Biphenyls.
9. VOC = Volatile Organic Compounds.
10. SVE = Soil Vapor Extraction.
11. N/A = Not Applicable.
12. AQMD = Air Quality Management District.

TABLE 18

SCREENING OF PCB-IMPACTED CONCRETE TECHNOLOGIES[1,2]

Former Pechiney Cast Plate, Inc., Facility

Vernon, California

Technology Type	Description	Remediation Scenario	Effectiveness	Implementability	Cost	Screening Comments
NO ACTION						
No Action	No further remedial action would take place at the site. Retained for comparative purposes only.	PCB[3]-impacted concrete	Poor. Does not meet RAOs[4]. Does not reduce mobility, toxicity, or volume of known wastes.	Good	Low. There are no costs associated with this alternative.	Retained- NCP[5] requirements [40 CFR[6] 300.430 (e)(6)].
INSTITUTIONAL CONTROLS						
Institutional controls (examples) - Deed covenants - Land use covenants - Zoning	Institutional controls are legal and administrative controls to prevent or control exposure to site occupants if residual COCs remain on-site. These typically run with the land for perpetuity or as long as residual contamination exists.	PCB-impacted concrete	Moderate	Moderate	Low	Not retained. Institutional Controls would most likely include either deed or land use covenants. Property owner input is necessary to make determinations regarding future Site use.
EX SITU TREATMENT						
Demolition/Disposal	Demolition of PCB-impacted concrete followed by offsite disposal. Demolition involves the use of heavy equipment. Concrete is sawcut and removed or demolished using a hydraulic breaker. Requires dust and noise controls. Offsite disposal requires sizing of concrete, stockpiling, and loading into transport trucks. Available space is needed onsite for stockpiling. Concrete with concentrations less than remediation goals would be recycled and used as backfill material onsite. Concrete with concentrations greater than remediation goals would be transported offsite and disposed of in an appropriate landfill.	PCB-impacted concrete	Good. Would meet RAOs.	Good	Moderate	Retained
IN SITU TREATMENT						
Scarification	Impacted concrete is removed in thin layers using a grinder. Creates a fine dusty material. Requires use of heavy equipment with grinder attachments. Dust and noise controls are necessary to protect workplace. Impacted concrete must be well defined in area of application. Scarification is a slow process and large areas require a long period of time to complete.	PCB-impacted concrete	Poor. Not cost effective on multi-layered surfaces that would require demolition and removal of overlying concrete after scarification of surface, to provide access to lower impacted layers for additional scarification.	Moderate. Impacted concrete dust will require collection and disposal.	Moderate	Not retained due to lack of effectiveness and dust collection issues.

TABLE 18

SCREENING OF PCB-IMPACTED CONCRETE TECHNOLOGIES[1,2]

Former Pechiney Cast Plate, Inc., Facility

Vernon, California

Technology Type	Description	Remediation Scenario	Effectiveness	Implementability	Cost	Screening Comments
Encapsulation	Encapsulation or sealing of impacted concrete slab areas involves physically microencapsulating wastes by sealing them with an applied compound. Encapsulation is typically performed with polymers, resins or other proprietary binding and sealing compounds that are bonded to the impacted surface. Would require periodic inspection and maintenance to maintain integrity of sealed areas.	PCB-impacted concrete	Poor. Surface encapsulation effectiveness is limited to the adhesion between coating and bound wastes. Long-term integrity has not been effectively demonstrated on other sites. Selected bonding agent would need to be resistant to ultraviolet radiation, or another protective coating would be required to protect sealed areas.	Moderate. Requires the impacted surface to be free of dust or other materials that might affect bonding capability of sealant.	High	Not retained. Encapsulation would require the slab areas to be left in place. This would not allow demolition of existing below grade foundations and footings that are being removed as a component of the Site cleanup. Encapsulation would likely require TSCA[7]-related deed covenants or land use restrictions. Property owner input is necessary to make determinations regarding future Site use.
Steam Cleaning/ Pressure Washing	High pressure and/or hot water is applied to impacted concrete surfaces to remove contaminants. Not effective on multiple layered surfaces. Does not remove heavily-stained or oil impregnated impacts on porous concrete.	PCB-impacted concrete	Poor. Existing surface slabs were steam cleaned during above grade demolition work associated with building and floor cleaning; subsequent concrete coring indicated PCB-impacts above screening criteria were still present at the surface.	Moderate. Requires collection and disposal of impacted washing rinsate.	High. Not cost effective on multi-layered surfaces that would require demolition and removal of overlying concrete to provide access to lower impacted layers for additional steam cleaning.	Not retained due to lack of effectiveness.

Notes:

1. Definitions of Criteria:
   -Effectiveness is ability of the remedial technology to achieve remedial action objectives;
   -Implementability is a measure of the technical and administrative feasibility of constructing, operating and maintaining a remedial alternative; and,
   -Cost refers to a relative cost compared with other technologies in same technology type. Costs will be refined later in the FS process.
2. Table uses a relative rating scheme: Good, Moderate, Poor for effectiveness and implementability criteria; high, moderate, and low for cost criteria.
3. PCB - Polychlorinated Biphenyls.
4. RAOs = Remedial Action Objectives.
5. NCP = National Contingency Plan.
6. CFR = Code of Federal Regulations.
7. TSCA= Toxic Substances Control Act deed covenants [40 CFR 761.61(a)(8)]

TABLE 19

EVALUATION OF REMEDIAL ALTERNATIVES

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Remedial Alternative Description [40 CFR 300.430 (d)(1)][1]	Overall Protection of Human Health and Environment [40 CFR 300.430 (e)(9)(iii)(A)]	Compliance with ARARs[2] [40 CFR 300.430 (e)(9)(iii)(B)]	Long-Term Effectiveness [40 CFR 300.430 (e)(9)(iii)(C)]	Reduction of Mobility, Toxicity, and Volume by Treatment [40 CFR 300.430 (e)(9)(iii)(D)]	Short-Term Effectiveness [40 CFR 300.430 (e)(9)(iii)(E)]	Implementability [40 CFR 300.430 (e)(9)(iii)(F)]	State Support/Agency Acceptance [40 CFR 300.430 (e)(9)(iii)(H)]	Community Acceptance [40 CFR 300.430 (e)(9)(iii)(I)]	Capital Cost [40 CFR 300.430 (e)(9)(iii)(G)(1)]	O&M[3] Cost for 3 years [40 CFR 300.430 (e)(9)(iii)(G)(2)]	Total Cost NPV[4] 3 years [40 CFR 300.430 (e)(9)(iii)(G)(3)]
Alternative 1: No Action [40 CFR 300.430 (e)(6)]									**$0**	**$0**	**$0**
No further action required.	Would not meet RAOs[5] for the Site.	No activities proposed that would trigger action-specific ARARs.	RAOs not achieved.	Limited reduction in mobility, toxicity, or volume.	RAOs not achieved.	No additional effort required.	Not Acceptable.	Not Acceptable.			
Alternative 2: Excavation and Disposal of All COC[6]-Impacted Soil + Demolition and Disposal of PCB[7]-Impacted Concrete									**$18,200,000**	**$0**	**$18,200,000**
1) Soil Excavation and Off-Site Disposal.	Would meet RAOs of mitigating shallow COC-impacted soils above the risk-based remediation goals summarized in Table 15. Excavation poses no overall element of risk to human health or the environment.	Would comply with requirements established by the City of Vernon H&EC[8].	Would prevent potential human exposure by eliminating pathways between future receptors and soil, soil vapor, and airborne dusts. Evaluated using CERCLA[9] guidelines (US EPA, 1988, section 6.2.3.3)[10].	Would reduce the volume of COCs in soil. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.4).	Risk to receptors and the environment is low if appropriate PPE[11] is worn by workers and dust, noise and odor controls are implemented. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Technology is reliable and effective. Impacted areas would need to be well defined, but implementation relatively straightforward using commercially available equipment. Shoring or other stability measures are required. Necessary permits must be obtained. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.6).	Will be evaluated after draft report has been presented to City of Vernon H&EC.	Will be evaluated during public participation process.			
2) Concrete Demolition and Off-Site Disposal.	Would meet RAOs to mitigate PCBs above the risk-based remediation goals established for future site use of concrete. These goals are summarized in Table 15.	Does not comply with impacted concrete reuse requirements proposed by the City of Vernon H&EC.	Would prevent potential human exposure by eliminating pathways between potential receptors and recycled concrete and airborne concrete dust. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce the volume of PCBs in concrete. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.4).	Risk to receptors and the environment is low if appropriate PPE is worn by workers and dust, noise and odor controls are implemented. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Impacted areas would need to be well defined, but implementation relatively straightforward using commercially available equipment. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.6).	Will be evaluated after draft report has been presented to City of Vernon H&EC.	Will be evaluated during public participation process.			

TABLE 19

EVALUATION OF REMEDIAL ALTERNATIVES

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Remedial Alternative Description [40 CFR 300.430 (d)(1)][1]	Overall Protection of Human Health and Environment [40 CFR 300.430 (e)(9)(iii)(A)]	Compliance with ARARs[2] [40 CFR 300.430 (e)(9)(iii)(B)]	Long-Term Effectiveness [40 CFR 300.430 (e)(9)(iii)(C)]	Reduction of Mobility, Toxicity, and Volume by Treatment [40 CFR 300.430 (e)(9)(iii)(D)]	Short-Term Effectiveness [40 CFR 300.430 (e)(9)(iii)(E)]	Implementability [40 CFR 300.430 (e)(9)(iii)(F)]	State Support/Agency Acceptance [40 CFR 300.430 (e)(9)(iii)(H)]	Community Acceptance [40 CFR 300.430 (e)(9)(iii)(I)]	Capital Cost [40 CFR 300.430 (e)(9)(iii)(G)(1)]	O&M[3] Cost for 3 years [40 CFR 300.430 (e)(9)(iii)(G)(2)]	Total Cost NPV[4] 3 years [40 CFR 300.430 (e)(9)(iii)(G)(3)]
Alternative 3: Excavation and Disposal of Shallow COC-Impacted Soil + Soil Vapor Extraction for Shallow and Deep VOC-Impacted Soil + Demolition and Disposal of PCB-Impacted Concrete									**$1,400,000**	**$1,100,000**	**$2,500,000**
1) Soil Excavation and Off-Site Disposal.	Would meet RAOs of mitigating shallow COC-impacted soils above the risk-based remediation goals summarized in Table 13 and pose no overall element of risk to human health or the environment.	Would comply with requirements established by the City of Vernon H&EC.	Would prevent potential human exposure by eliminating pathways between future receptors and soil, soil vapor, and airborne dusts. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce the volume of COCs in soil. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.4).	Risk to receptors and the environment is low if appropriate PPE is worn by workers and dust, noise and odor controls are implemented. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Technology is reliable and effective. Impacted areas would need to be well defined, but implementation relatively straightforward using commercially available equipment. Shoring or other stability measures are required. Necessary permits must be obtained. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.6).	Will be evaluated after draft report has been presented to City of Vernon H & EC.	Will be evaluated during public participation process.			
2) Soil Vapor Extraction.	Would meet RAOs of mitigating deeper soils impacted with COCs for protection of groundwater and poses no overall element of risk to human health or the environment.	Would comply with requirements established by the City of Vernon H&EC.	SVE is a presumptive remedy and can achieve site-specific remediaiton goals for VOC-impacted soils. Would prevent potential human exposure by eliminating pathways between future receptors and soil and soil vapors. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce mobility of VOCs in subsurface, and reduce mass of VOCs and Stoddard Solvents in soil. Evaluated using CERCLA guidelines(US EPA, 1988, section 6.2.3.4).	Poses low risk to receptors and the environment if appropriate PPE is worn by workers and noise and odor controls are established during implementation. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Implementation requires well defined impacted areas with an effective monitoring program of the SVE system. Technology is reliable and effective. Necessary permits must be obtained for operation. Evaluated using CERCLA guidelines(US EPA, 1988, section 6.2.3.6).	Will be evaluated after draft report has been presented to City of Vernon H&EC.	Will be evaluated during public participation process.			
3) Concrete Demolition and Off-Site Disposal.	Would meet RAOs to mitigate PCBs above the risk-based remediation goals established for future site use of concrete. These goals are summarized in Table 13.	Does not comply with requirements established by the City of Vernon H&EC.	Would prevent potential human exposure by eliminating pathways between potential receptors and recycled concrete and airborne concrete dust. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce the volume of PCBs in concrete. Evaluated using CERCLA guidelines(US EPA, 1988, section 6.2.3.4).	Appropriate PPE would be worn by workers and dust, noise and odor controls would be established during implementation. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Impacted areas would need to be well defined, but implementation relatively straightforward using commercially available equipment. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.6).	Will be evaluated after draft report has been presented to City of Vernon H & EC.	Will be evaluated during public participation process.			

TABLE 19

EVALUATION OF REMEDIAL ALTERNATIVES

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Remedial Alternative Description [40 CFR 300.430 (d)(1)][1]	Overall Protection of Human Health and Environment [40 CFR 300.430 (e)(9)(iii)(A)]	Compliance with ARARs[2] [40 CFR 300.430 (e)(9)(iii)(B)]	Long-Term Effectiveness [40 CFR 300.430 (e)(9)(iii)(C)]	Reduction of Mobility, Toxicity, and Volume by Treatment [40 CFR 300.430 (e)(9)(iii)(D)]	Short-Term Effectiveness [40 CFR 300.430 (e)(9)(iii)(E)]	Implementability [40 CFR 300.430 (e)(9)(iii)(F)]	State Support/Agency Acceptance [40 CFR 300.430 (e)(9)(iii)(H)]	Community Acceptance [40 CFR 300.430 (e)(9)(iii)(I)]	Capital Cost [40 CFR 300.430 (e)(9)(iii)(G)(1)]	O&M[3] Cost for 3 years [40 CFR 300.430 (e)(9)(iii)(G)(2)]	Total Cost NPV[4] 3 years [40 CFR 300.430 (e)(9)(iii)(G)(3)]
Alternative 4: In Situ Stabilization of Shallow PCB/Metals-Impacted Soil + Soil Vapor Extraction for Shallow and Deep VOC-Impacted Soil + Demolition and Disposal PCB-Impacted Concrete									**$1,700,000**	**$1,100,000**	**$2,800,000**
1) Soil Stabilization.	Would not meet RAO of mitigating shallow COC-impacted soils above the risk-based remediation goals summarized in Table 15. Poses no overall element of risk to human health or the environment. Would meet RAO of mitigating soils impacted with COCs for protection of groundwater.	Would comply with requirements established by the City of Vernon H&EC.	Would prevent potential human exposure by eliminating pathways between future receptors and soil, soil vapor, and airborne dusts. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce the mobility and possibly toxicity of COCs in soil. No reduction in volume. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.4).	Risk to receptors and the environment is low if appropriate PPE is worn by workers and dust, noise and odor controls are implemented. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Requires a bench-scale test and a well defined impacted area. Implementation relatively straightforward using large diameter auger drilling rig. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.6).	Will be evaluated after draft report has been presented to City of Vernon H&EC.	Will be evaluated during public participation process.			
2) Soil Vapor Extraction.	Would meet RAOs of mitigating deeper soils impacted with COCs for protection of groundwater and poses no overall element of risk to human health or the environment.	Would comply with requirements established by the City of Vernon H&EC.	SVE is a presumptive remedy and can achieve site-specific remediation goals for VOC-impacted soils. Would prevent potential human exposure by eliminating pathways between future receptors and soil and soil vapors. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce mobility of VOCs in subsurface, and reduce mass of VOCs and Stoddard Solvents in soil. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.4).	Poses low risk to receptors and the environment if appropriate PPE is worn by workers and noise and odor controls are established during implementation. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Implementation requires well defined impacted areas with an effective monitoring program of the SVE system. Technology is reliable and effective. Necessary permits must be obtained for operation. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.6).	Will be evaluated after draft report has been presented to City of Vernon H&EC.	Will be evaluated during public participation process.			
3) Concrete Demolition and Off-Site Disposal.	Would meet RAOs to mitigate PCBs above the risk-based remediation goals established for future site use of concrete. These goals are summarized in Table 15.	Does not comply with impacted concrete reuse requirements proposed by the City of Vernon H&EC.	Would prevent potential human exposure by eliminating pathways between potential receptors and recycled concrete and airborne concrete dust. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.3).	Would reduce the volume of PCBs in concrete. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.4).	Appropriate PPE would be worn by workers and dust, noise and odor controls would be established during implementation. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.5).	Impacted areas would need to be well defined, but implementation relatively straightforward using commercially available equipment. Evaluated using CERCLA guidelines (US EPA, 1988, section 6.2.3.6).	Will be evaluated after draft report has been presented to City of Vernon H&EC.	Will be evaluated during public participation process.			

Notes:
1. National Contingency Plan Code of Federal Regulations Guidance.
2. Applicable or relevant and appropriate requirements (ARARs).
3. O&M = Operations And Maintenance.
4. NPV = Net Present Value.
5. RAO = Remedial Action Objective.
6. COC = Chemical of Concern.
7. PCB = Polychlorinated Biphenyls.
8. CERCLA = Comprehensive Environmental Response, Compensation and Liability Act.
9. H&EC = Health and Environmental Compliance.
10. United States Environmental Protection Agency (US EPA), Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, 1988.
11. PPE = Personal Protective Equipment.